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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/486,890	05/26/2000	RYOUMEI OMOTE	00177/530850	2420

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WENDEROTH LIND & PONACK
2033 K STREET NW
SUITE 800
WASHINGTON, DC 20006

EXAMINER

PIZIALI, ANDREW T

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 10/04/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/486,890

Applicant(s)

OMOTE ET AL.

Examiner

Andrew T Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/14/2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-55 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☒ Claim(s) 48 is/are allowed.
- 6) ☒ Claim(s) 16, 19, 21, 23, 26, 28, 30, 32-33, 36, 38, 40, 42, 44-46, 52 and 54 is/are rejected.
- 7) ☒ Claim(s) 50 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/26/2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1. 6) ☐ Other: _____

Continuation of Disposition of Claims: Claims withdrawn from consideration are 17,18,20,22,24,25,27,29,31,34,35,37,39,41,43,47,49,51,53 and 55.

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claims 16, 19, 21, 23, 26, 28, 30, 32-33, 36, 38, 40, 42, 44-46, 48, 50, 52 and 54 are drawn to a transparent conductive film with an arithmetic mean roughness within a range of 0.4nm to 4.0nm and a root-mean-square roughness within a range of 0.6nm to 3.0nm.

Group II, claims 17, 20, 24, 27, 29, 31, 34, 37, 39, 41, 43, 47, 49, 51, 53 and 55 are drawn to a transparent conductive film composed of an indium oxide-tin oxide film with a mean crystal grain size within a plane of a metallic oxide observed at a surface of the transparent conductive film within a range of 40nm to 200nm.

Group III, claims 18, 22, 25 and 35 are drawn to a transparent conductive film composed of a fluorine or antimony added tin oxide film with a mean crystal grain size within a plane of a metallic oxide observed at a surface of the transparent conductive film within a range of 80nm to 400nm.

2. The inventions listed as Groups I, II and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature of Group I is a transparent conductive film with an arithmetic mean roughness within a range of 0.4nm to 4.0nm and a root-mean-square roughness within a range of 0.6nm to 3.0nm. The special technical feature of Group II is a transparent conductive film composed of an indium oxide-tin oxide film with a mean crystal grain size within a plane of a metallic oxide observed at a surface of the transparent conductive film within a range of 40nm to 200nm. The special technical feature of Group III is a fluorine or antimony added tin oxide film with a mean crystal grain size within a plane of a metallic oxide observed at a surface of the transparent conductive film within a range of 80nm to 400nm.

3. During a telephone conversation with Michael R. Davis on 9/20/02 a provisional election was made with traverse to prosecute the invention of Group I, claims 16, 19, 21, 23, 26, 28, 30, 32-33, 36, 38, 40, 42, 44-46, 48, 50, 52 and 54. Affirmation of this election must be made by applicant in replying to this Office action. Claims 17-18, 20, 22, 24-25, 27, 29, 31, 34-35, 37, 39, 41, 43, 47, 49, 51, 53 and 55 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

- ✓ 5. Figures 5, 6, 17, 19 and 20 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). On page 3, lines 19-22 and on page 24, lines 1-5 the applicants disclose that Figures 5, 17 and 19 are prior art. On page 4, lines 3-7 the applicants disclose that Figure 6 is prior art. On page 27, lines 8-12 the applicants disclose that Figure 20 is prior art. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- ✓ 7. Claims 23 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite as a result of the term “(Rp/Rmax)”. The use of parenthesis to contain a limitation in a claim is indefinite. Deletion of the parenthesis would result in the removal of this rejection.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- ✓ 9. Claims 16, 19, 23, 26, 28, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,217,995 to Handa.

Regarding claims 16, 19, 23, 26, 28, 30 and 32, Handa discloses a transparent conductive

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film, for use in a transparent touch panel, that has in its surface shape, an Ra of 4nm (column 14, line 40 through column 15, line 33). Handa does not mention the specific Rms, but considering the method of production it appears that the standard deviation would be within a range of 0.6 to 3.0nm.

The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection.

Regarding claim 19, Handa discloses that the film is composed of ITO (column 15, lines 11-14).

Regarding claims 23, 26, Handa does not mention the specific Rp/Rmax, but considering the method of production and its Ra value of 4nm, it appears that Rp/Rmax is set at 0.55 or less.

Regarding claims 28, 30, 32, Handa does not produce the transparent conductive film by a coating or printing process with a sol-gel material, but it is the examiner's position that the film of Handa is identical to or only slightly different than the film prepared by the method of the claims.

Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the

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same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. The burden has been shifted to the applicant to show obvious difference between the claimed product and the prior art product. Handa either anticipated or strongly suggested the claimed subject matter. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with the Handa.

- ✓ 10. Claims 21, 33, 36, 38, 40, 42, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Handa as applied to claims 16, 19, 23, 26, 28, 30 and 32 above, and further in view of USPN 5,411,792 to Yukinobu et al. (hereinafter referred to as Yukinobu).

Regarding claim 21, Handa discloses the use of an ITO transparent conductive film, but does not mention the use of a fluorine or antimony doped tin oxide film. Yukinobu discloses that both ITO and antimony doped tin oxide layers (ATO) are used to form transparent electrodes for liquid crystal display panels (column 1, lines 6-22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the transparent electrode of Handa from either ITO or ATO, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of design choice.

Regarding claims 33, 36, 38, 40, 42, 44 and 45, Handa discloses that the ITO film coated substrate forms a transparent electrode for a liquid crystal display (column 15, lines 8-33), but does not mention using the coated substrate in a touch panel. Yukinobu discloses that

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transparent conductive ITO coated substrates may be used in liquid crystal displays or touch panels (column 1, lines 6-22). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the transparent conductive ITO coated substrate of Handa as a transparent conductive ITO coated substrate of a touch panel, as disclosed by Yukinobu, because both devices require transparent conductive film coated substrates.

11. Claims 16, 19, 21, 23, 26, 28, 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,675,469 to Iida et al. (hereinafter referred to as Iida).

Regarding claims 16, 19, 21, 23, 26, 28, 30 and 32, Iida discloses a transparent conductive film that has a surface roughness such that the average grain diameter is in the range of 0.1 to 0.9 microns (100 to 900nm) (column 10, lines 21-29). Iida does not mention the specific Ra or Rms, but considering that the average grain diameter of Iida is in the range of 0.1 to 0.9 microns (100 to 900nm), compared to the applicants mean crystal grain size range of 40 to 200nm, it appears that the arithmetic mean roughness of Iida would be within a range of 0.4 to 4.0nm and the standard deviation would be within a range of 0.6 to 3.0nm.

Regarding claim 19, Iida discloses that the film may be composed of ITO (column 3, lines 4-19).

Regarding claim 21, Iida discloses that the film may be composed of antimony doped tin oxide (paragraph bridging columns 3 and 4).

Regarding claims 23 and 26, Iida does not mention the specific R_p/R_{max} , but considering that the average grain diameter of Iida is in the range of 0.1 to 0.9 microns (100 to 900nm) and considering the method of production used by Iida, it appears that R_p/R_{max} is set at 0.55 or less.

Regarding claims 28, 30 and 32, Iida does not produce the transparent conductive film by a coating or printing process with a sol-gel material, but it is the examiner's position that the film of Iida is identical to or only slightly different than the film prepared by the method of the claims.

12. Claims 16, 19, 21, 23, 26, 28, 30, 32-33, 36, 38, 40, 42, 44-46, 52 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,411,792 to Yukinobu in view of USPN 6,089,154 to Masaki et al. (hereinafter referred to as Masaki).

Regarding claims 16, 19, 21, 23, 26, 28, 30, 32-33, 36, 38, 40, 42, 44-46, 52 and 54, Yukinobu discloses that it is known to produce transparent conductive films for electrodes of touch panels via printed transparent conductive ink (column 1, lines 6-59). Yukinobu does not mention a specific apparatus to print the transparent conductive films, but the apparatus used by the current applicants (see current specification page 27, lines 8-12) is disclosed by Masaki (see Figure 8). Masaki discloses that the apparatus may be used to produce thin films for electronic components (column 1, lines 4-40). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the printed transparent conductive films of Yukinobu with the apparatus of Masaki, because the apparatus forms a printed uniform thin transparent conductive film, which is desirable for electronic applications.

Considering the identical apparatus used to produce the film of Yukinobu in view of Masaki, compared to the applicants' apparatus, it appears that the transparent conductive film produced by Yukinobu in view of Masaki would produce a transparent conductive film with an Ra within a range of 0.4 to 4.0nm and a Rms within a range of 0.6 to 3.0nm.

Regarding claim 19, Yukinobu discloses that the transparent conductive film may be composed of ITO (column 1, lines 13-16).

Regarding claim 21, Yukinobu discloses that the transparent conductive film may be composed of ATO (column 1, lines 13-16).

Regarding claims 23 and 26, considering the identical apparatus used to produce the film of Yukinobu in view of Masaki, compared to the applicants apparatus, it appears that the transparent conductive film produced by Yukinobu in view of Masaki would produce a transparent conductive film with an R_p/R_{max} of 0.55 or less.

Regarding claims 28, 30 and 32, the method of making the film is a printing process with a sol-gel material (see all of Masaki).

Regarding claim 46, Yukinobu does not mention the specific weight ratio of indium to tin, but it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the indium and tin content, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In addition, the examiner takes Official Notice that the indium to tin weight ratio claimed by the applicants is a standard indium to tin weight ratio used to produce ITO. Although Masaki does not mention the specific R_a and R_{ms} values claimed by the applicant, method claim 46 lacks a step that is not disclosed by Yukinobu in view of Masaki. The applicant is reminded that if it is argued that the method disclosed by Yukinobu in view of Masaki does not produce a film with the claimed roughness values then critical and/or essential step(s) must be lacking from claim 46.

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13. Claims 16, 19, 21, 23, 26, 28, 30, 32-33, 36, 38, 40, 42, 44-46, 52 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 5,411,792 to Yukinobu in view of USPN 5,477,783 to Hashimura.

Regarding claims 16, 19, 21, 23, 26, 28, 30, 32-33, 36, 38, 40, 42, 44-46, 52 and 54, Yukinobu discloses that it is known to produce transparent conductive films for electrodes of touch panels via printed transparent conductive ink (column 1, lines 6-59). Yukinobu does not mention a specific apparatus to use to print the transparent conductive films, but Hashimura discloses that the apparatus used by the applicants (see current specification page 27, lines 8-12) may be used to produce thin films for electronic components (see column 1, lines 4-24 and Figure 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the printed transparent conductive films of Yukinobu with the apparatus of Hashimura, because the apparatus forms a uniform thin transparent conductive film, which is desirable for electronic applications.

Considering the identical apparatus used to produce the film of Yukinobu in view of Hashimura, compared to the applicants' apparatus, it appears that the transparent conductive film produced by Yukinobu in view of Hashimura would produce a transparent conductive film with an Ra within a range of 0.4 to 4.0nm and a Rms within a range of 0.6 to 3.0nm.

Regarding claim 19, Yukinobu discloses that the transparent conductive film may be composed of ITO (column 1, lines 13-16).

Regarding claim 21, Yukinobu discloses that the transparent conductive film may be composed of ATO (column 1, lines 13-16).

Regarding claims 23, 26, considering the identical apparatus used to produce the film of Yukinobu in view of Hashimura, compared to the applicants apparatus, it appears that the transparent conductive film produced by Yukinobu in view of Hashimura would produce a transparent conductive film with an R_p/R_{max} of 0.55 or less.

Regarding claims 28, 30, 32, the method of making the film is a printing process with a sol-gel material (see all of Masaki '154).

Regarding claim 46, Yukinobu does not mention the specific weight ratio of indium to tin, but it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the indium and tin content, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In addition, the examiner takes Official Notice that the indium to tin weight ratio claimed by the applicants is a standard indium to tin weight ratio used to produce ITO. Although Hashimura does not mention the specific R_a and R_{ms} values claimed by the applicant, method claim 46 lacks a step that is not disclosed by Yukinobu in view of Hashimura. The applicant is reminded that if it is argued that the method disclosed by Yukinobu in view of Hashimura does not produce a film with the claimed roughness values then critical or essential step(s) must be lacking from claim 46.

Allowable Subject Matter

14. Claim 48 is allowed.

15. Claim 50 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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16. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or suggest a method of fabricating a transparent conductive film for use in a transparent touch panel comprising coating or printing with a sol-gel material, performing a drying process, then an oxidation burning process at a temperature increasing rate of 40-60C per minute within a temperature range of 200-400C, followed by a reduction burning process.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Piziali whose telephone number is (703) 306-0145. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-5665.


atp
September 26, 2002

Andrew T Piziali
Examiner
Art Unit 1775


DEBORAH JONES
SUPERVISORY PATENT EXAMINER